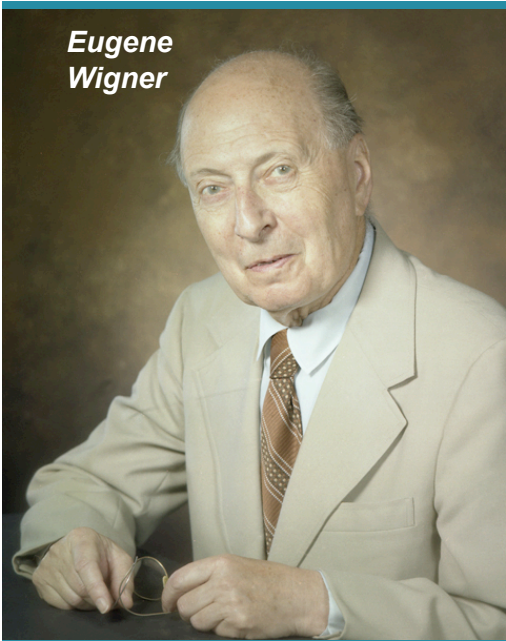# New IBM Arrives at NCCS

Eugene Wigner

Dubbed "Eugene" after Wigner

- **Oak Ridge National Laboratory and IBM have teamed up to bring the next generation of the IBM Blue Gene supercomputer, the Blue Gene/P, to ORNL**

- **The new system was accepted in late September and features 8,192 compute cores and will be capable of more than 27 trillion calculations a second, or 27 teraflops**

- **The system has been dubbed "Eugene," after former ORNL director of research and development Eugene Wigner**

- **Wigner, a Hungarian physicist and mathematician, was an early advocate for the Manhattan Project and would later win the Nobel Prize in physics in 1963**

"Selected chemistry and materials applications especially have shown strong performance on the Blue Gene." **Thomas Zacharia, ORNL's Associate Laboratory Director for Computing and Computational Sciences**

Eugene - IBM BG/P

- 2,048 compute nodes

- 8,192 850MHz PPC450 cores

- 4,096GB memory

- Multiple system networks
  - torus network (3.4 Gb/s per link)
  - global collective network (6.8 Gb/s per link)
  - global interrupt network

- 93 TB DDN 9550 disk (GPFS)

- 27 TFLOPS peak

Access to Blue Gene

- Access via allocated projects
  - Apply for a project
  - Approved projects will receive an allocation
  - Initial allocations will be for a year
  - Users can then apply for accounts

- Preferred projects are those that utilize the BG/P architecture to its full potential

Filesystems

- GPFS filesystems

- User space
  - /gpfs/fs1/{username}
  - source code, compilations, and submissions
  - 2GB quota

- Scratch space
  - /gpfs/fs0/{username}
  - temporary storage of data
  - swept daily
    - files older than 14 days will be removed

- Compute nodes have access to the GPFS filesystem

Filesystems

- NFS filesystem
  - /ccs/home/{username}
  - Shared home directory space

- HPSS
  - Archival storage
  - hsi used to access

Compiling

- C/C++
  - Compilers for the front end
    - xlc, xlc++, xlC, cc
  - Compilers for the back end
    - bgxlc, bgxlc++, bgxlC, bgcc, mpixlc, mpixlcxx

- Fortran
  - Compilers for the front end
    - xlf, xlf90, xlf95, xlf2003
  - Compilers for the back end
    - bgxlf, mpixlf77,bgxlf90, mpixlf90, bgxlf95, mpixlf95, bgxlf2003, mpixlf2003

Job submissions

- Submission is through LoadLeveler scheduler

- Submission of job script
  - %> llsubmit myjob.cmd

- Checking job status
  - %> llq

- NOTE: Minimum job size is 64 nodes
  - Will soon be reduced to 32 nodes

Sample Job Script – job.cmd

```
#@ job_name = LoadL_Sample_1

#@ error = $(job_name).$(jobid).out

#@ output = $(job_name).$(jobid).out

#@ environment = COPY_ALL;

#@ wall_clock_limit = 00:20:00

#@ notification = error

#@ notify_user = {username@email.gov}

#@ job_type = bluegene

#@ bg_size = 64

#@ account_no = {Project ID}

#@ class = prod

#@ queue

/usr/bin/mpirun -exe {executable name} -mode VN -np 48
   -verbose 1 -args "-t 1"
```

URLs to remember

- Project Application
  - **http://www.nccs.gov/user-support/access/eugene-project-request/**

- Web site for Eugene
  - **http://www.nccs.gov/computing-resources/eugene/**

- Need Help?
  - **help@nccs.gov**

http://www.nccs.gov/computing-resources/eugene/

Questions?

http://www.nccs.gov

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